Use the pdf problem set posted to the website whenever DMC is referred, as the numbering differs from that of the text. Show your work and explain your reasoning.

Practice

 (1) DMC Problem 15.1

(2) DMC Problem 15.2

(3) DMC Problem 15.6

(4) DMC Problem 15.9

(5) DMC Problem 16.5

Recitation Lab (TA will work these out in lab)

Problem 1. There are 5 blue, 3 red, and 2 yellow marbles in an urn. If you draw 3 marbles, what is the probability that less than 2 will be red if:

   a) You draw with replacement?
   b) You draw without replacement?

Problem 2: Assume you live in a state that allows license plate patterns with four uppercase English letters followed by two numbers. What is the probability of getting a license plate with a repeated letter or digit (all 4 letters should not be different)?

Problem 3: A box contains three coins: two regular coins and one biased coin because it has two-heads (P(H)=1), answer the following:

   a. You pick a coin at random and toss it. What is the probability that it lands heads up?
   b. You pick a coin at random and toss it, and get heads. What is the probability that it is the two-headed coin?

Problem 4:
I have a box full of 100 light bulbs. From my prior testing I know there are 5 defective ones in the box. I picked 3 bulbs at random from the box. What is the probability that none of them are defective?

Problems to Hand in for Homework:

Problem 1 (10 points) 15.15 from DMC
Problem 2 (10 points) 15.39(q) from DMC
Problem 3 (20 points) 16.4 from DMC
Problem 4 (20 points) A family has two children, find the following probabilities (having a girl or a boy is equally likely):

   a.   One boy and one girl given the first child is a boy
   b.   Two girls given that at least one is a girl
   c.   Two girls given that the older one is a girl

Problem 5 (20 points): For a clinical trial patients are divided into two groups: 0 – Control group,1-Treatment group. The probability that the trial goes wrong (adverse effect on the patient) within the control group is p_0 and this probability for the treatment group is p_1. The allocation of patients to the two groups is alternate and their outcomes are independent. What is the probability that the first adverse event occurs for the control group?

Problem 6 (20 points): You are watching an NFL game in a café and you observe someone who is supporting Dallas Cowboys. What is the probability that they were actually born within 25 miles of Dallas?

Assume that:

   a.   The probability that a randomly selected person in a typical local cafe environment is born within 25 miles of Dallas is 1/20, and;
   b.   The chance that a person born within 25 miles of Dallas actually supports Cowboys is 7/10;
   c.   The probability that a person not born within 25 miles of Dallas supports Cowboys with probability 1/10.